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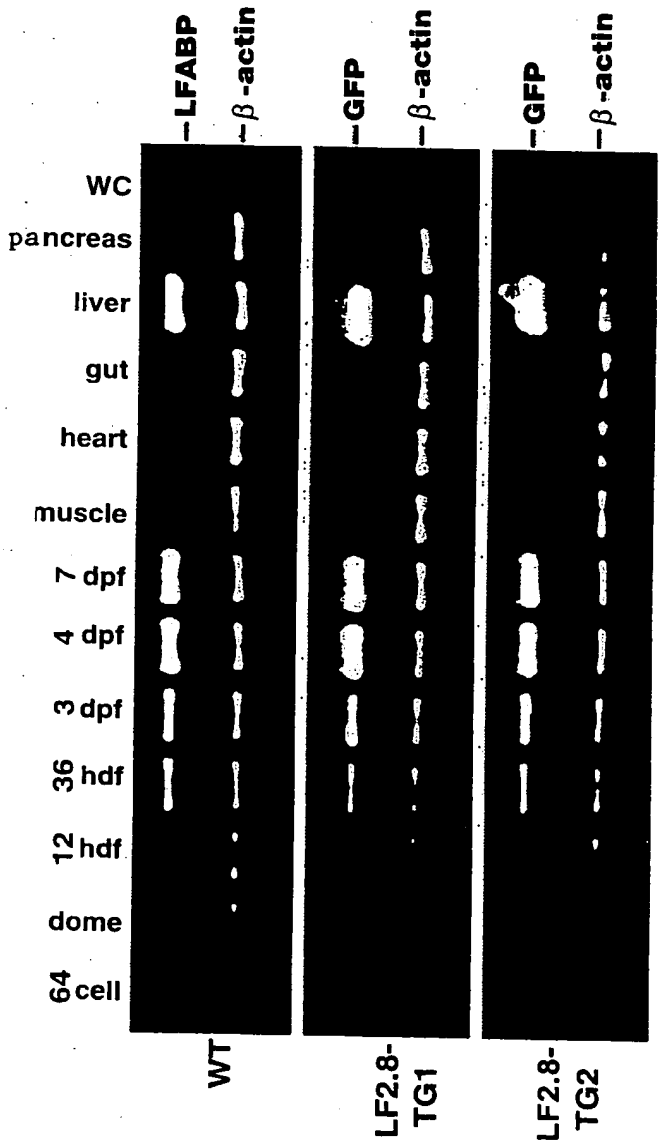


Figure 1

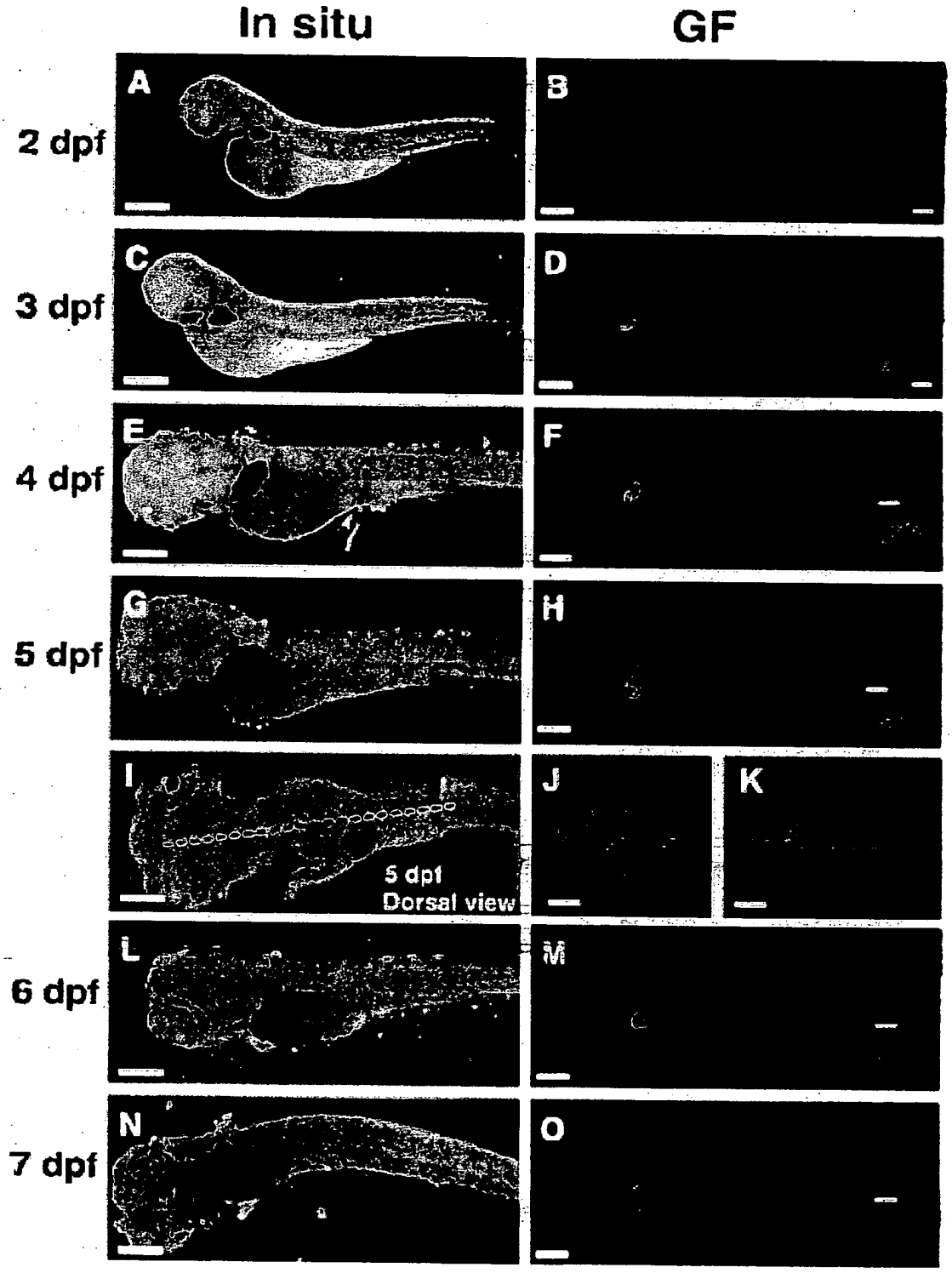

In situ
GF
2 dpf
3 dpf
4 dpf
5 dpf
6 dpf
7 dpf
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
5 dpf
Dorsal view

Figure 2

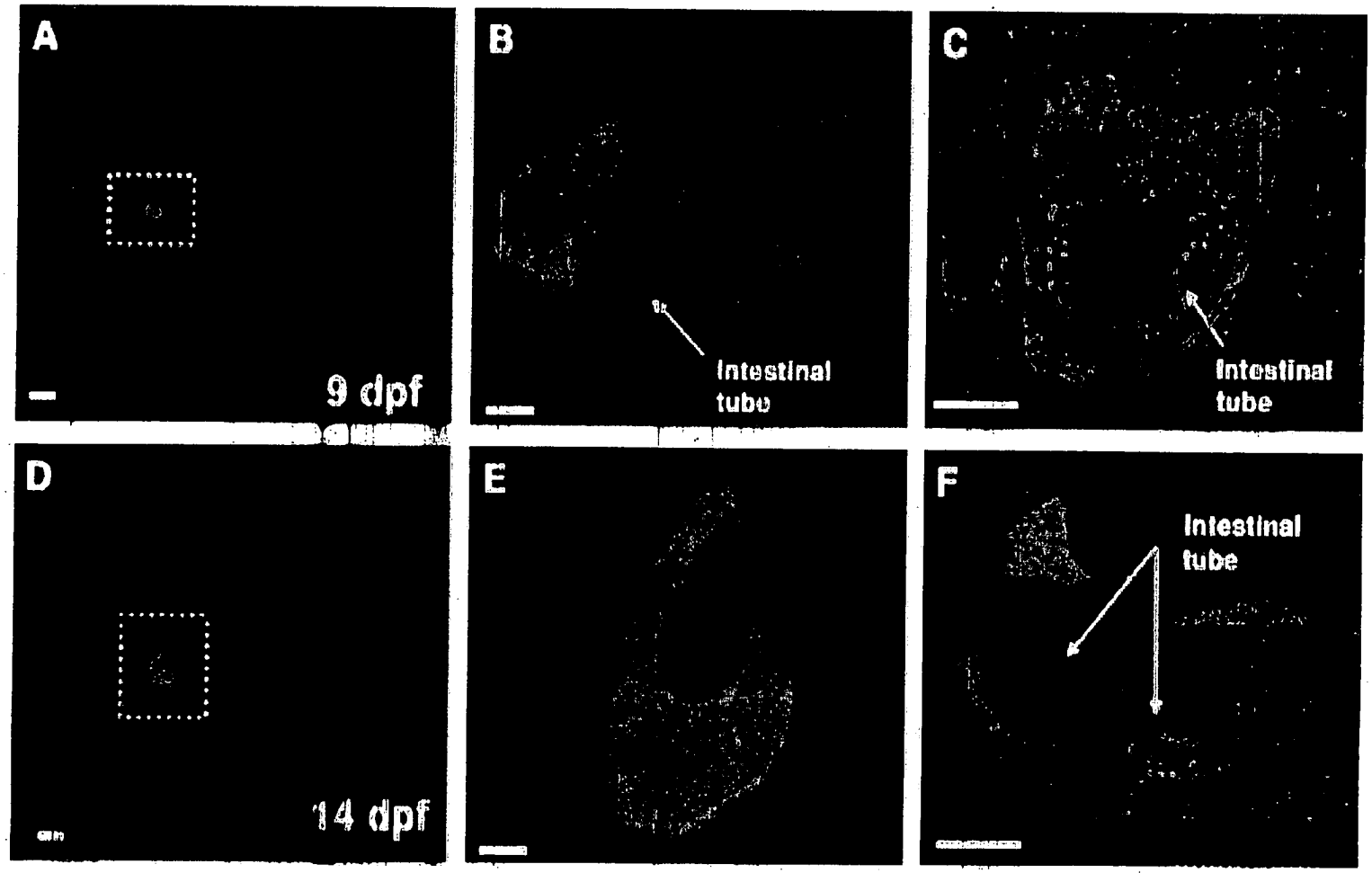
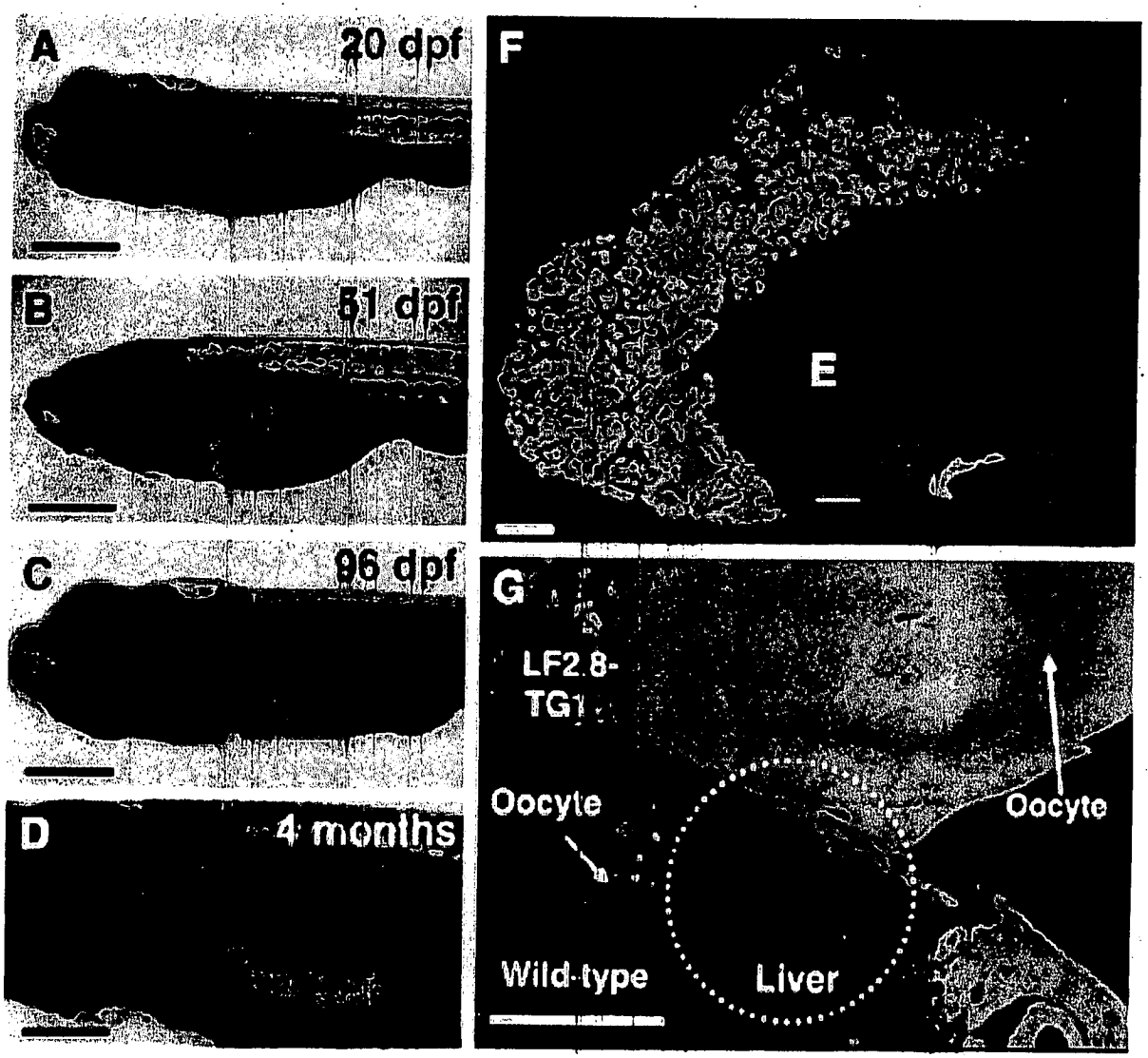

A
9 dpf
B
Intestinal tube
C
Intestinal tube
D
14 dpf
E
F
Intestinal tube

Figure 3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20 dpf
B
31 dpf
C
96 dpf
D
4 months
F
E
G
LF2.8-
TG1
Oocyte
Oocyte
Wild-type
Liver

Figure 4

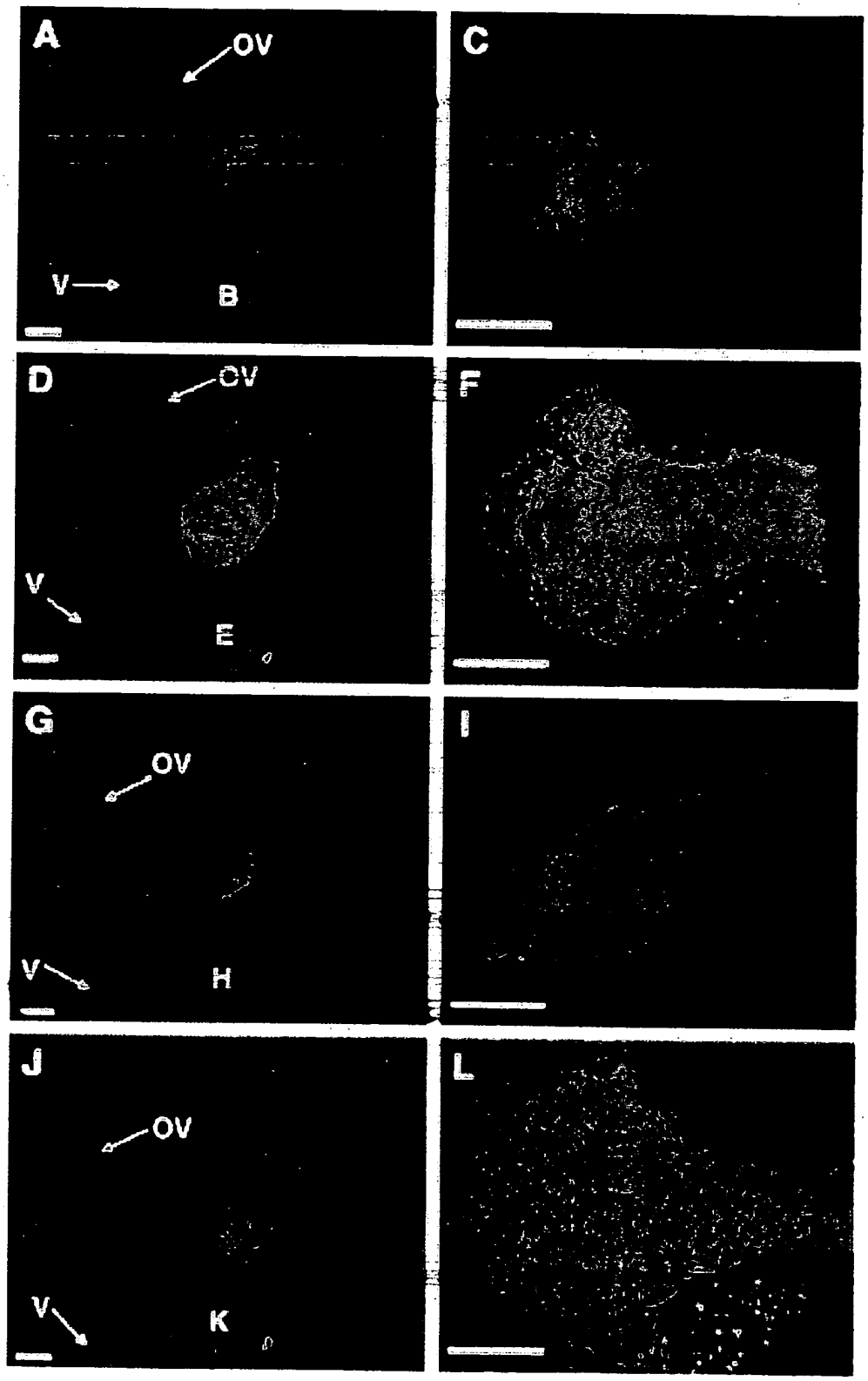

Figure 5

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tcattaatgc aaatttctaa tcaaccactc acatggcagc aactcaatgc attaaggtac 180
gtagacatgg tcaagacgat ctgctgcagt tcaaactgag catcagaatg gggaaggaag 240
aggatttcag tgactttgaa cgaggcatgg ttgttgctgc cggatgggct gctctgagta 300
tttcagaaac tgctgatctt cagggatttt cacgcacaac catctctagg gtttacagag 360
aatgatctga aaagaggaaa tatccagtga gcggcagttc tgtgggtgca aatgccttgt 420
tgatgccaga gatcagagga gaatggccag actggttcca gctgatagaa aggcaacagt 480
aactcaaata agcactcgtt acaaccgagc tctgcagaag agcatctctg aacacacaac 540
acgtccaacc ttgaggcaga tgggctacag cagcagaaga ccacaccggg tgccgctcct 600
gtcagctaag aacaggaaac tgaggctaca attcacacag actcaccaaa actggacatt 660
tattattagc ccccttaga atttttcatt tgataatatt tttcttctgg cgaaagcctc 720
atttgtttta tatattatag aataaaatta gtttttaata gtttttatgc cattttaagg 780
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caaataattt atttgtgttg attttaagca aacaaattaa atttaataaa atacaactta 1200
atctgtttgt ttaaattcag ccctaataaa ttgtttacag ccacttaacg taaaaaaatt 1260
gagtaaatcc aaggaatcat ctctgaataa ttttttcagt gtatatatat atatatatat 1320
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ctaacttaac cagccttttg ttgtcagact gaacagactt tccatctgca ttattagaga 1560
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ctctcgtgct ttaagtttat taaagattat tttatttatt tattatttta tttatctatt 1860
tatttattta gttgtttatt tattcctgca gatcatgcct tgtgcctttt tacatttaat 1920
ttaattttta atttaatttc cttttatttt tttttatttt tttattttat tttattttac 1980
agtctgacaa atactgaact aaaaacctct cagatcatgt ctatgcattt cattttattt 2040
tatttcattt tatattatta attttaatat ttttatttta cagtctgaca aatactgaat 2100
taaaaaccat cagatcatgt ctcatgcatt taacttaact ttatttaatt caattaaatt 2160
gtttgtttgt ttgtttcctt gcatttgttt gtttgttttt tacaatctga catactggac 2220
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caaaggaaca acttttaaaa tattaattct gtatcaaaat ctcttttgat acatttaatt 2340
gatttaaaaa agcagttcac ccaagaaaca tttcctcaca gtcgaatggt tgtaaacttt 2400
tatgaattac tttcacagaa aaagattttt ggaagaatat tggaaaaaaa gcagccattg 2460
acttccatag taacaacaaa aaatactatg gaagtcaatg gctgtttttt caccattcgg 2520
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ccacatgcac acctcatctt ctgctggagt tgatgaacgg tgggttgttc aaacagcagc 2700
aggtcattga ctgaactcct ctcgatataa aagctgcaga tctgaagctg accttcactt 2760
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agaactacga ggagtttctc agagccatct ctctgccaga agaggtcatt aaactggcca 2880
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Figure 6

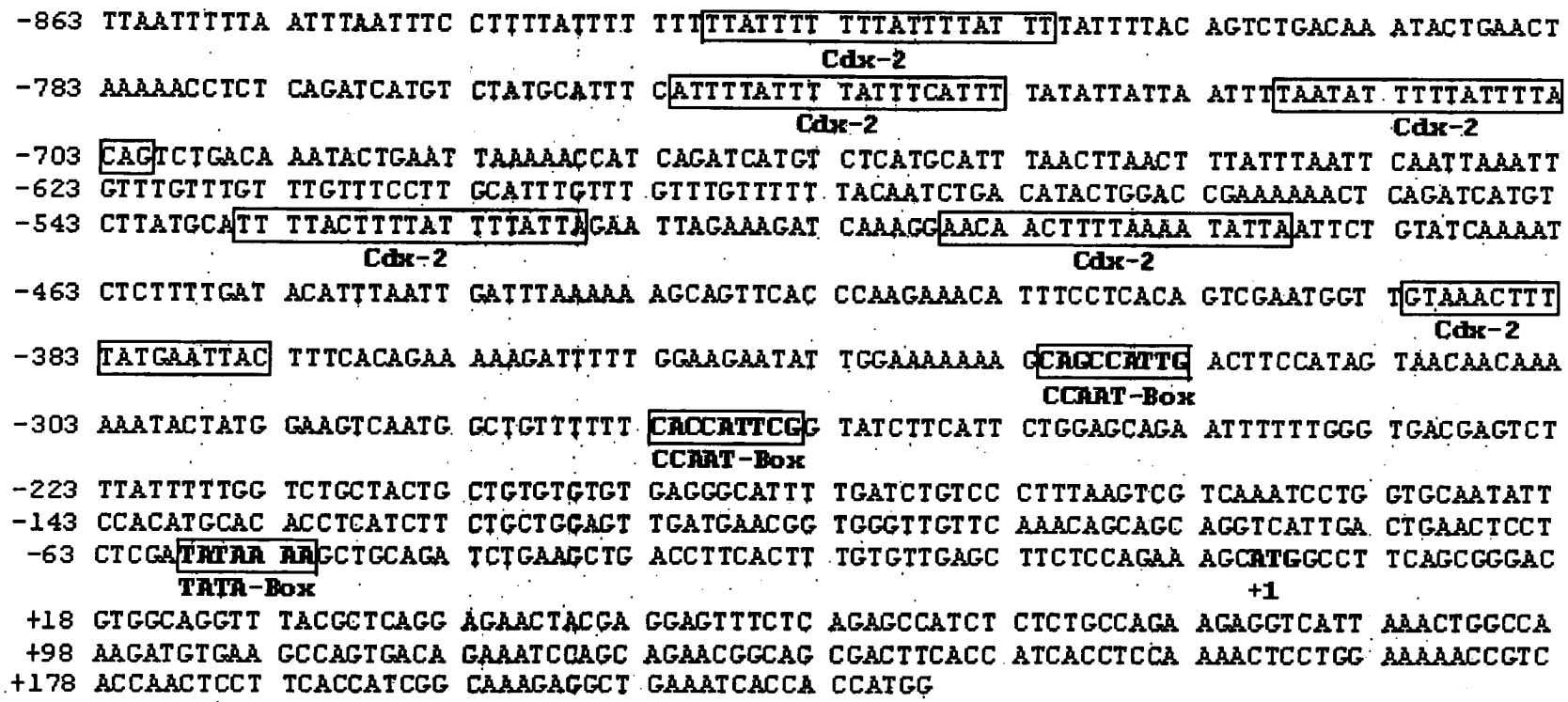

Figure 7

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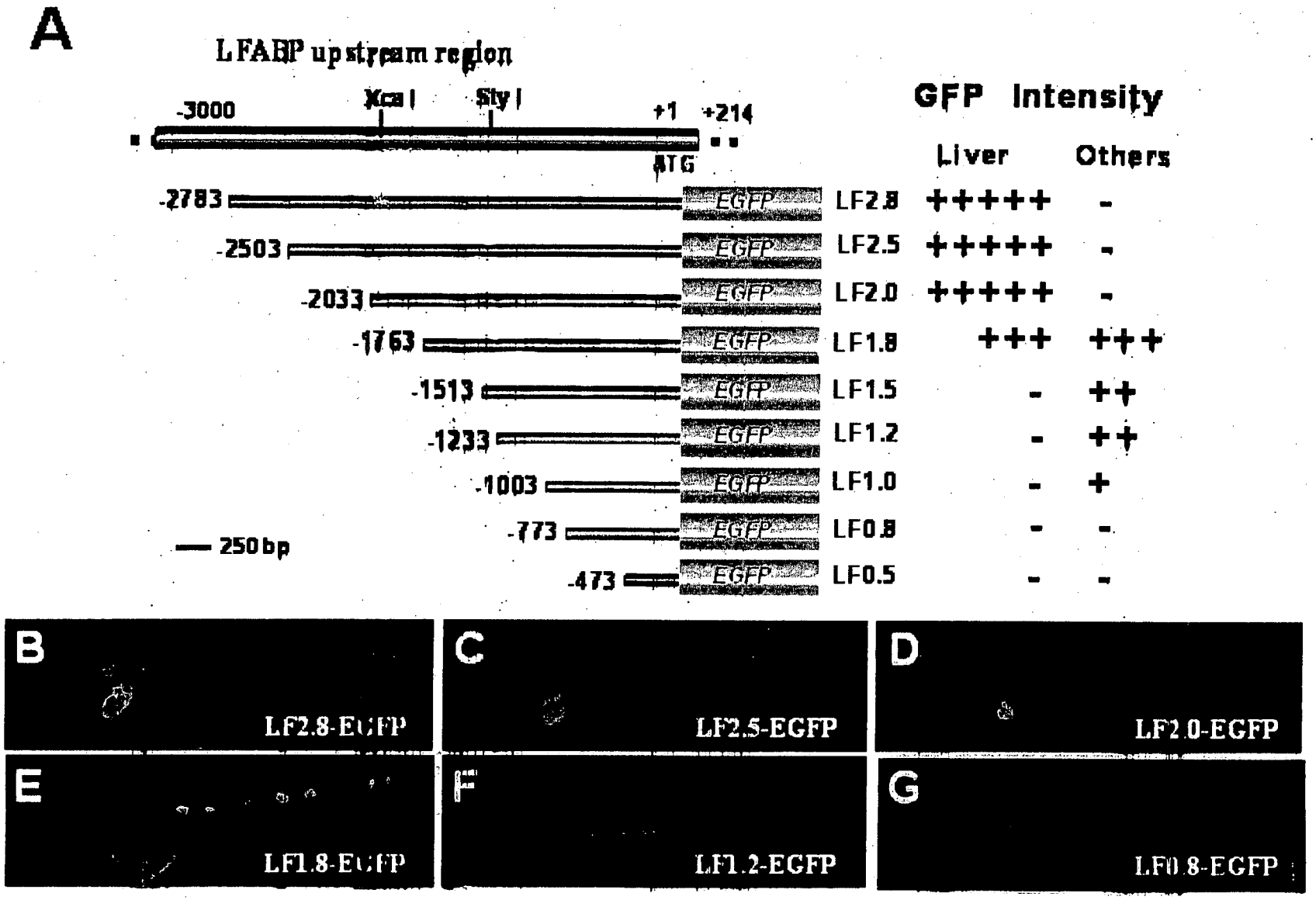

A
LFABP upstream region
-3000
Xcal
Sty I
+1
+214
ATG
GFP Intensity
Liver
Others
-2783
EGFP
LF2.8
+++++
-
-2503
EGFP
LF2.5
+++++
-
-2033
EGFP
LF2.0
+++++
-
-1763
EGFP
LF1.8
+++
+++
-1513
EGFP
LF1.5
-
++
-1233
EGFP
LF1.2
-
++
-1003
EGFP
LF1.0
-
+
-773
EGFP
LF0.8
-
-
-473
EGFP
LF0.5
-
-
250 bp
B
LF2.8-EGFP
C
LF2.5-EGFP
D
LF2.0-EGFP
E
LF1.8-EGFP
F
LF1.2-EGFP
G
LF0.8-EGFP

Figure 8

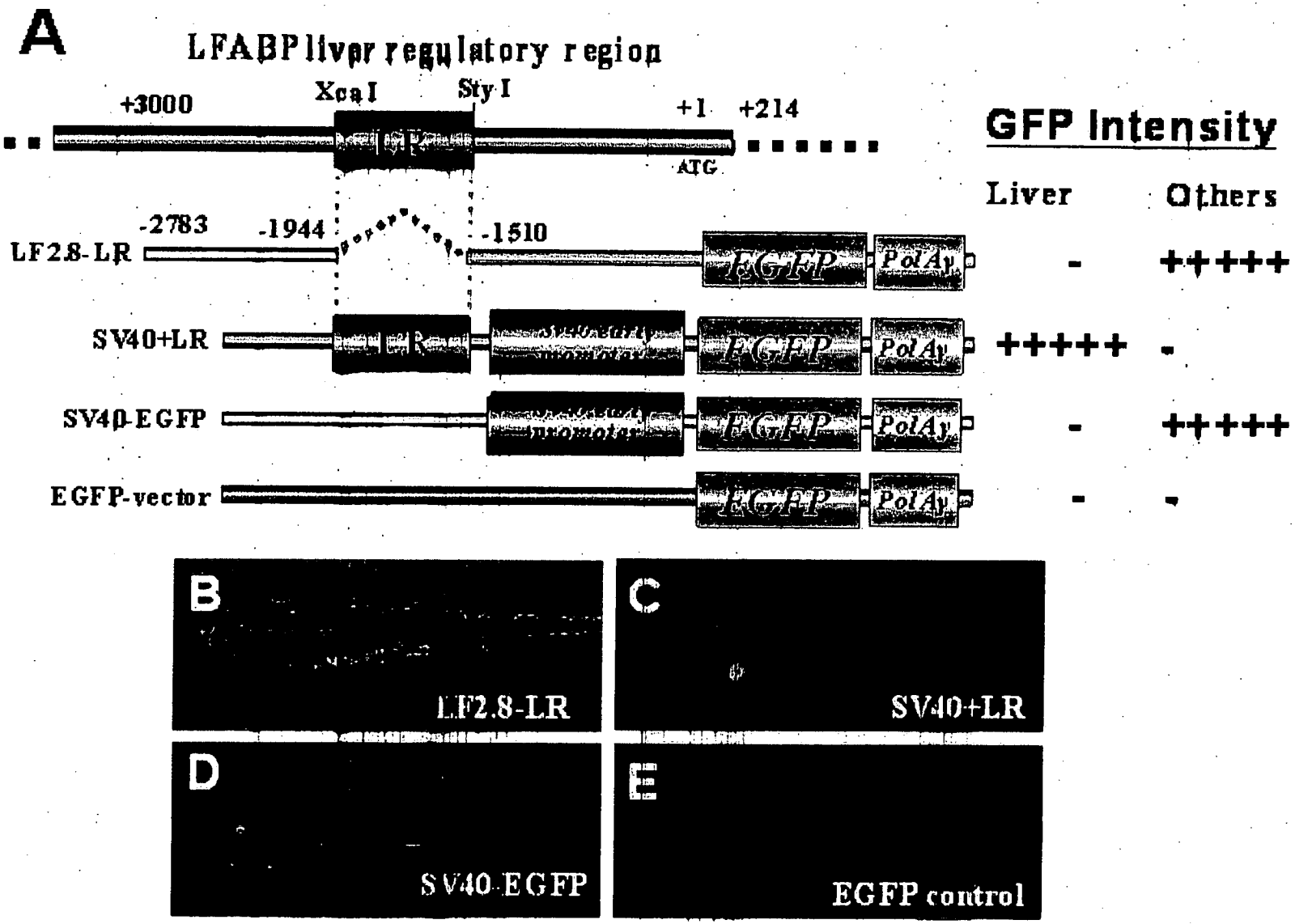

A
LFABP liver regulatory region
+3000
XcaI
StyI
+1
+214
ATG
-2783
-1944
-1510
LF2.8-LR
SV40+LR
SV40-EGFP
EGFP-vector
EGFP
PolAy
promoter
GFP Intensity
Liver
Others
-
+++++
+++++
-
-
+++++
-
-
B
LF2.8-LR
C
SV40+LR
D
SV40-EGFP
E
EGFP control

Figure 9

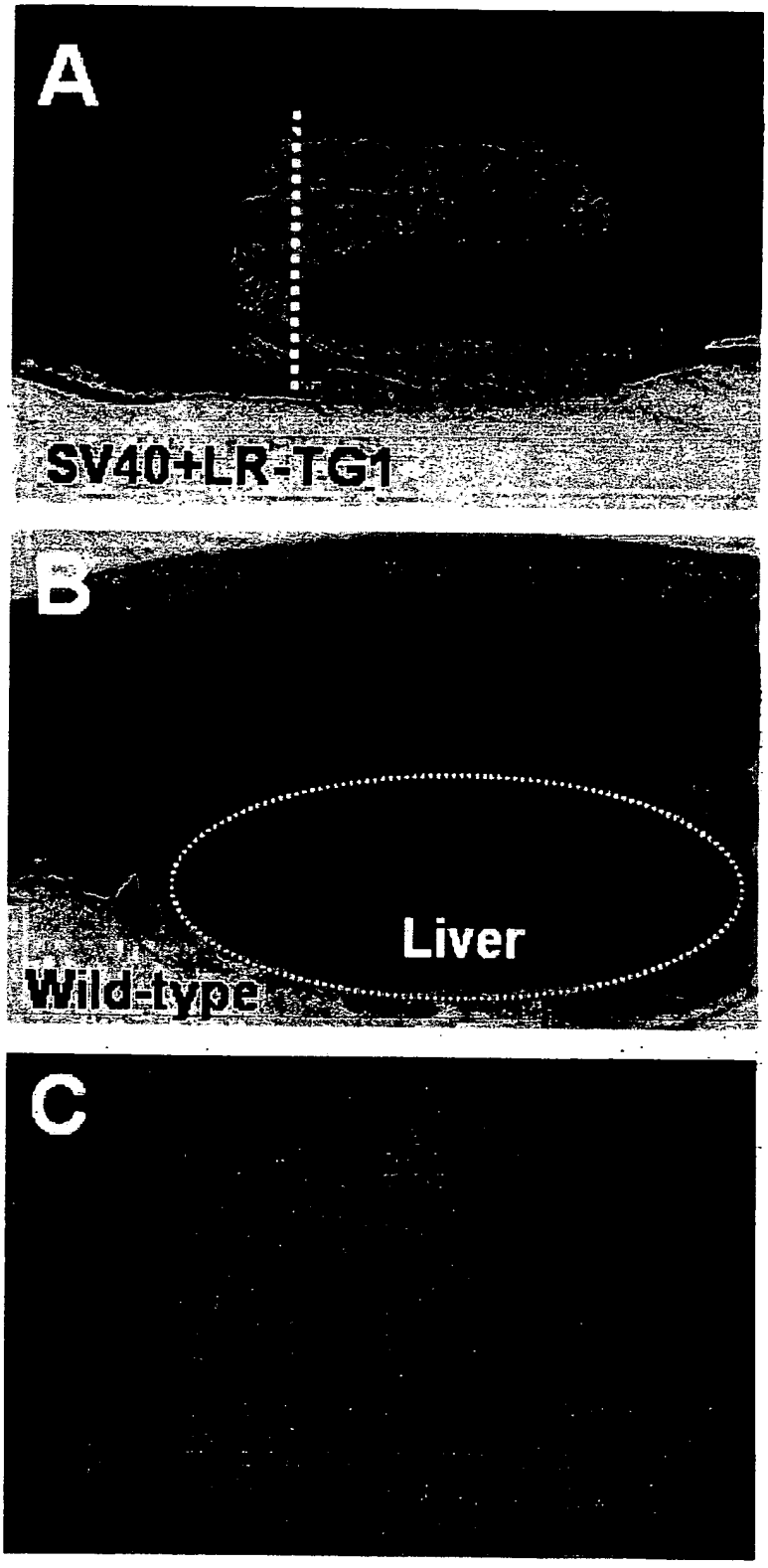


Figure 10

Liver regulatory element

-1983 AAGCTATTTT TTTTCGATAG TCTACAGAAC AAACCATCGG TATACAATGA CTTGCCTAAT TACCCTAACC TGCCTAGTTA

PDX1/ISL1(1)

-1903 CCCTAATTAA CCTAGTTAAG CCTTTAAATG TCACTTTAAG CTGTATAGAA GTGTCTTGAA GAATATCTAG TCTAATATTA

PDX1/ISL1(2)

-1823 TTGACTGTCA TCATGGCAAA GATAAAATAA ATCAGTTATT AAAACTATTA TGATTAGAAA TGTGCTGAAA CAATCTGCTC

-1944

:A ATAAATTTAA GGGGTTAAAT AATTCTGATT GCAAAAAAAA

HFH(1) HFH(2)

-1663 TGATGTCTGC AAAACTGTTG CAAATAATTTAATTTGTGTTG ATTTTAAGCAAACAAATTAA ATTTAATAAA ATACAACTTA

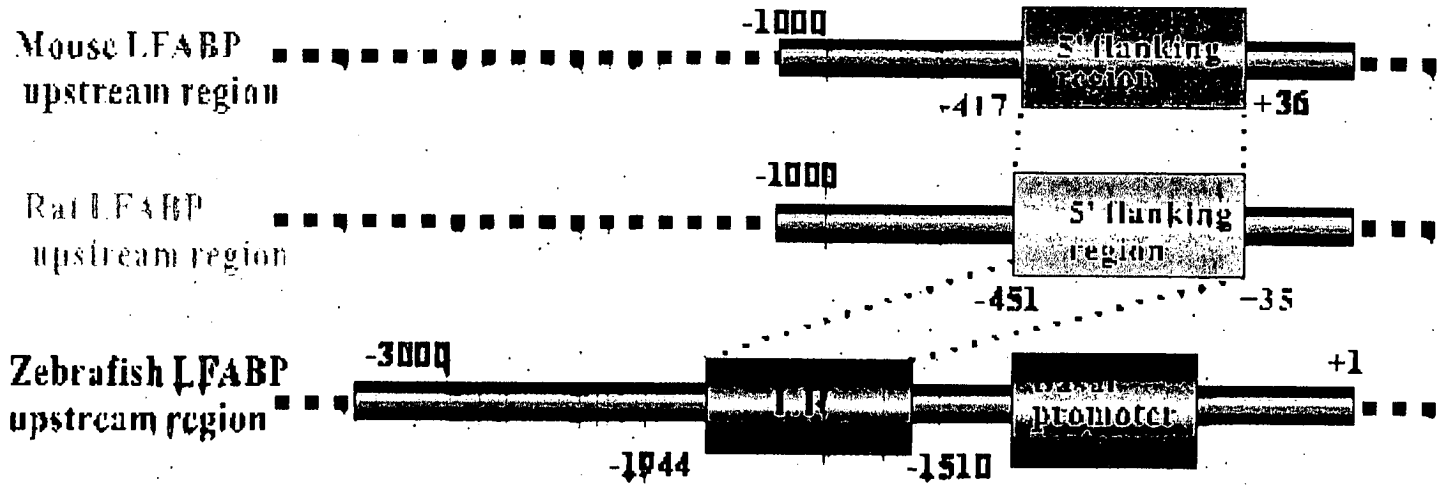
HNF1-α HNF3β

-1583 ATCTGTTTGT TTAAATTCAG CCCTAATAAA TTGTTTACAG CCACTTAACG TAAAAAAATT GAGTAAATCC AAGGAATCAT

Figure 11

-1510

(SEQ ID NO:1)




```
Rat L-FABP    (-451) AAAGATCCTAGGCTTTCCCCCTTCCCTCTTTTCTGCCCTCTTCCTTTCCTT--C--ATTTCTACCTTTTAGCTGTTATTTTAAGCACCATGTCGATACTA
Mouse L-FABP  (-417) CCATATACAAGTG--TGCACATGTACAAACACATACATATGTGCACTTAGG----TATATATGCATATGTG-CATTGCTGGA-GA----TGTG-ATTCAC
Zebrafish LR (-1945) --GTATACAATGACTTGCCTAATTACCCTAACCTGCCTAGTTACCCTAATTAACCTAGTTAAGCCTTTAAA-TGTCACTTTAAGC----TGT--ATAGAA
                                                                                    HNF-1α
Rat L-FABP    (-355) GCTAGTATGCTACCATGTTGGACTAGCTCTTATATTAGTTAGTTAGTATTGTACCATGTTGGACTAGCTCTTATATTAGTTAGTTAGTATTGTACCATGT
Mouse L-FABP  (-330) ATGTTTCTAA-ATTATTT----CTAAATGTATTGATGTTGCACATACATA----CATTTGTCAACATACATT---TCAACCATGCACACTTATTTCAT--
Zebrafish LR (-1854) GTGTCT-TGA-AGAATAT----CTAG-TCTAATATTATTG-ACTGTCAT-----CATG-GCAAAGATAAAATAAATCAGTTATTAAAACTATTATGAT--

Rat L-FABP    (-255) TGGACTAGCTCTTATATTAGTTAGTTAGTATTGTACCATGTTGGACTAGCTCTTATATTAGTTAGTTAGTATTGTACCATG--TTGGACTAGCTCTTATA
Mouse L-FABP  (-244) GAGTAGGGTTAAGTCACCATAAAGGCAAC-ATTTACAGA----GAGCTTTGCCCTTGGTTGG-ACTCACTAATGTTTGCTGAATTAGAACAAACCTCTGC
Zebrafish LR (-1769) TAGAAATGTGCTGAAACAATCTGCTCTCCGATAAACAGAAATTGAACAAAATAAACAGGGGG-GCTAATAAATTTAAGGGG--TTA-AATAAT--TCTGA

Rat L-FABP    (-157) TTAGTTAGTTAGTATTGTACCATGTTGGACTAGCTCTTCTATTAGTTAGTTAGTATTGTACCATGTTGGACTAGCTCTTATATTAGTTAGTTAGTATGCT
Mouse L-FABP  (-150) CTTGCCCACTCTGATTTTT--ATCGTTGACCATTGCTCTCAGGAGTTAATGTTTGA-GCCTGGCCATAAATAAATTCGACAATCACTGACCTA-TGGCCT
Zebrafish LR (-1675) -TTGCAAAAAA--AATGAT--GTC-TGCAAAACTGTTGCAAATAATTTATTTGTGTTGATTTTAAGCAAACAAATT--AAATTTAATAAAATA-CAACTT
                                                    HNF-1α                HNF-3β
                                                                +1
Rat L-FABP     (-57) ACCATGTTGGACTAGCTCTTCTATTAGTTAGTTAGTATGCTACCATGCTGGACTAGCTCTTTGGACAGGTG-GTAGATGAAAAGGGCTGAATG (+35) SEQ ID NO:28
Mouse L-FABP   (-54) ATATTCGAGGAGGAAGAATCCCCTTA-TAAAATAGGCAACAGTGG—GTGACCTGGCAGGCAGAGCTGTTGTGGTCAGCTGTGGAAAGGAAAC (+36) SEQ ID NO:29
Zebrafish LR (-1584) AATCTGTTTGTTTAAATTCAGCCCTA-ATAAATTGTTTACAGCCA--CTTAAC------GTAAAAAAATTGAGTAAATCCAAGG---------(-1510 SEQ ID NO:1
```

Figure 12

A

-1983 AAGCTATTTT TTTTCGATAG TCTACAGAAC AAACCATCGG TATACAATGA CTTGCCTAAT TACCCTAACC TGCCTAGTTA

PDX1/ISL1(1)

-1903 CCCTAATTAA CCTAGTTAAG CCTTTAAATG TCACTTTAAG CTGTATAGAA GTGTCTTGAA GAATATCTAG TCTAATATTA

PDX1/ISL1(2)

-1823 TTGACTGTCA TCATGGCAAA GATAAAATAA ATCAGTTATT AAAACTATTA TGATTAGAAA TGTGCTGAAA CAATCTGCTC

-1743 TCCGATAAAC AGAAATTGAA CAAAATAAAC AGGGGGGCTA ATAAATTTAA GGGGTTAAAT AATTCTGATT GCAAAAAAAA

HFH(1) HFH(2)

-1663 TGATGTCTGC AAAACTGTTG CAAATAATTT ATTTGTGTTG ATTTTAAGCA AACAAATTAA ATTTAATAAA ATACAACTTA

HNF-1α HNF-3β

-1583 ATCTGTTTGT TTAAATTCAG CCCTAATAAA TTGTTTACAG CCACTTAACG TAAAAAAATT GAGTAAATCC AAGGAATCAT

(SEQ ID NO: 30)

B

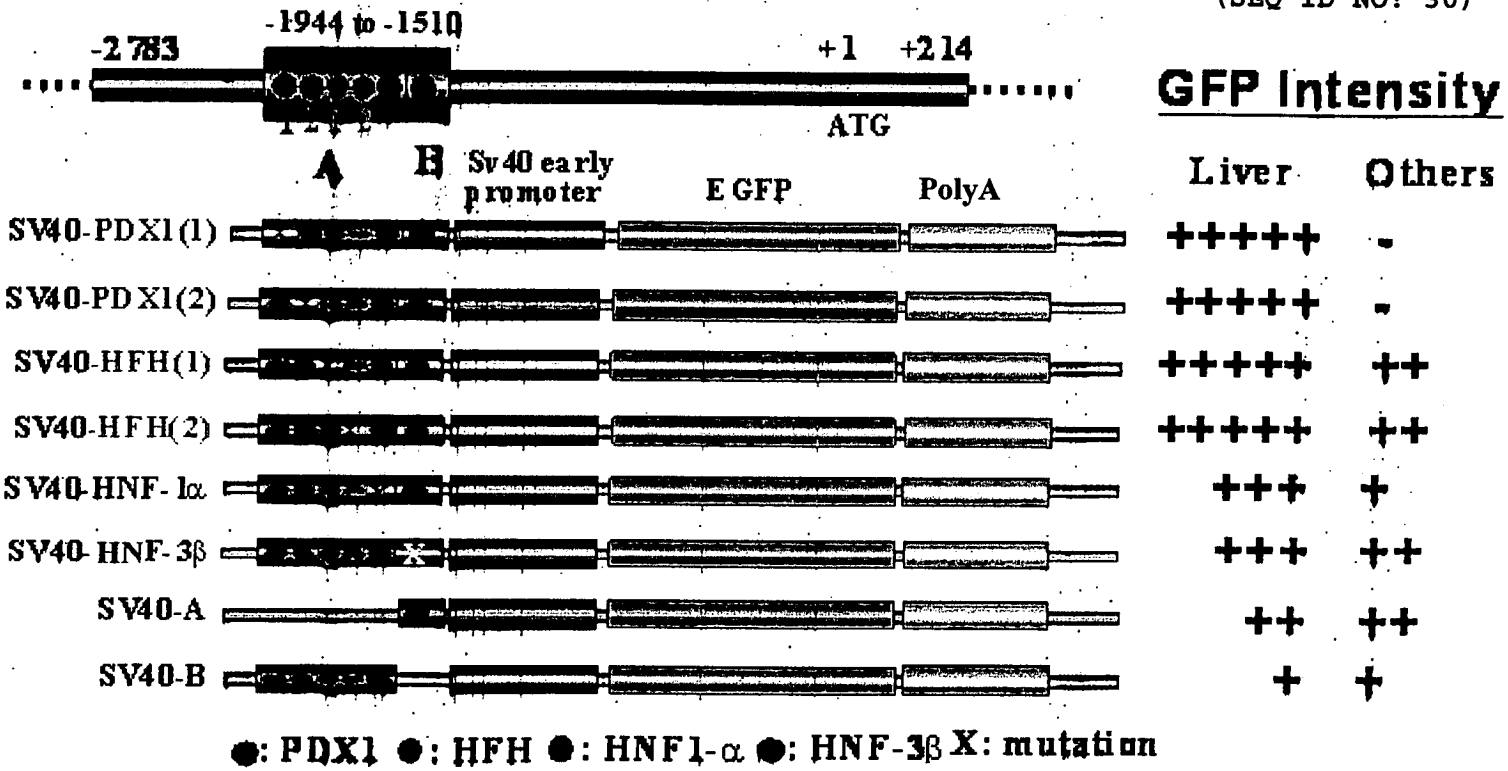


Figure 13

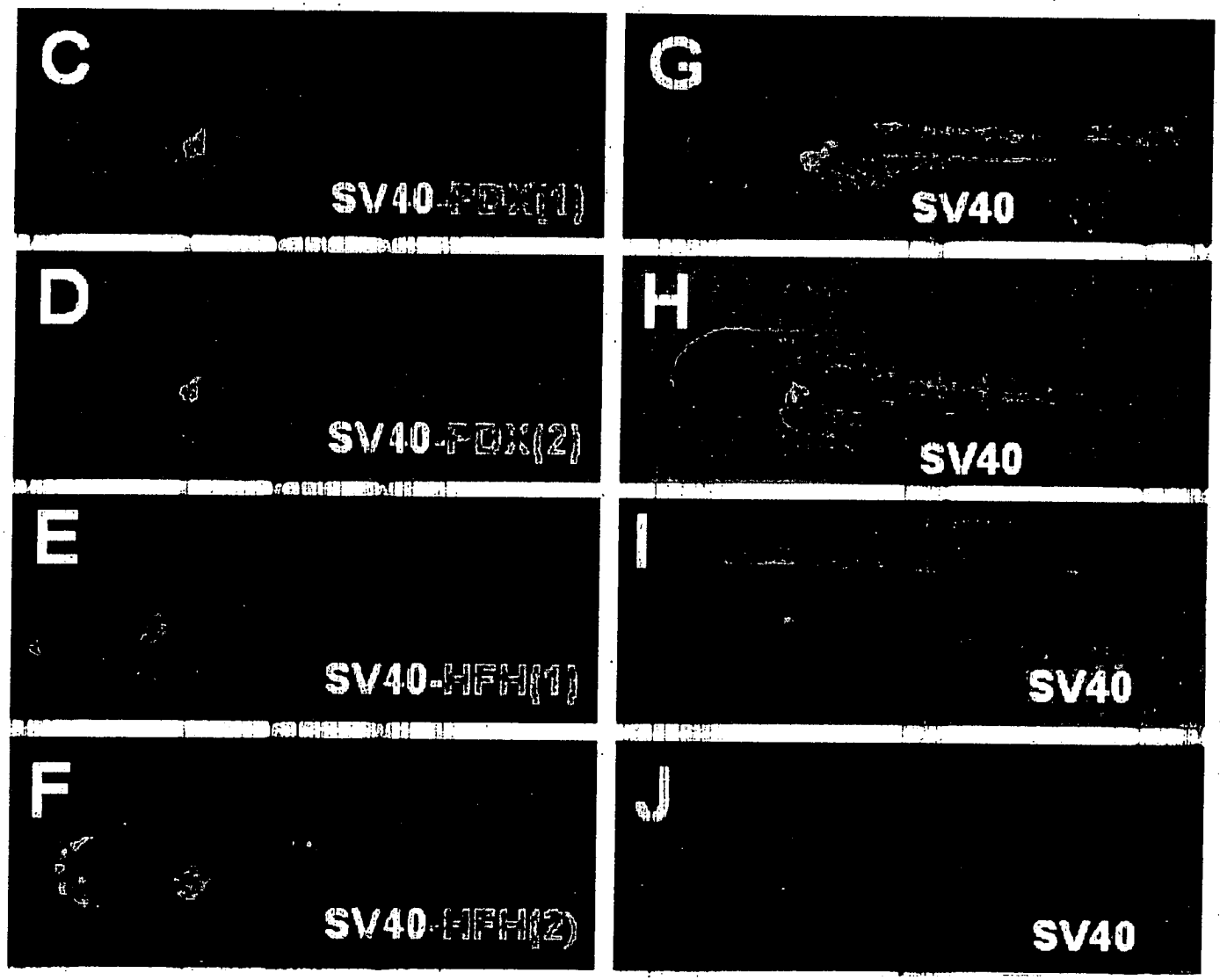


Figure 13 (continued)